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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/875,474	06/06/2001	Raul E. Sequeira	CE08236R	7955
22917	7590	02/08/2006	EXAMINER	
MOTOROLA, INC. 1303 EAST ALGONQUIN ROAD IL01/3RD SCHAUMBURG, IL 60196			ODOM, CURTIS B	
			ART UNIT	PAPER NUMBER
			2634	

DATE MAILED: 02/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/875,474

Applicant(s)

SEQUEIRA, RAUL E.

Examiner

Curtis B. Odom

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Divsalar et al. “Improved Parallel Interference Cancellation for CDMA”, IEEE Transactions on Communications, Vol. 46, No. 2, February 1998.

Regarding claim 1, Divsalar et al. discloses a method of interference cancellation in a multiple access communication channel comprising:

receiving (page 261, column 2, paragraph 2) a signal including at least a first data component (user 1 data, a_k) for a first channel within the multiple access communication channel and a second data component (multiuser interference) for a second channel within the multiple access communication channel on the communication channel;

determining a characteristic (Equation 9, E_b/N_o) of the multiple access communication channel;

estimating (page 264, column 2, paragraphs 3 and 4, Equation 18) an interference factor ($I(k)p_k$) caused by the second data component (see Equation 9) received on the multiple access communication channel based upon the characteristic (Equations 9 and 14);

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using (page 264, Equations 18 and 19, column 2, paragraphs 3 and 4) the interference factor ($I(k)p_k$) to cancel the second data component (multiuser interference) from the signal; and recovering (page 264, Equations 18 and 19) the first data component (page 260, column 2, section III, and page 261, Equation 4, a_k) from the signal.

Regarding claim 2, which inherits the limitations of claim 1, Divsalar et al. discloses the interference factor comprises one of a data estimate ($a_k(k-1)$) and a partial interference cancellation coefficient (page 264, column 2, paragraphs 3 and 4, p_k).

Regarding claim 3, which inherits the limitations of claim 1, Divsalar et al. discloses the signal comprises a spread spectrum code division multiple access system signal (Abstract).

Regarding claim 4, which inherits the limitations of claim 1, Divsalar et al. discloses the step of estimating comprises applying a function to the characteristic (Equation 14 and Equation A.6), wherein functions are applied to the characteristic to obtain ($a_k(k-1)$) which is apart of the interference factor (see Equations 9 and 14).

Regarding claim 5, which inherits the limitations of claim 4, Divsalar et al. discloses the function comprises a piece-wise linear estimation of the hyperbolic tangent (Equation A.6)

Regarding claim 6, which inherits the limitations of claim 4, Divsalar et al. discloses the function comprise a piece-wise linear estimation of a probability error function (page 263, column 2, Equations 11 and 14).

Regarding claim 7, which inherits the limitations of claim 1, Divsalar et al. discloses the characteristic comprises one of a signal estimation (E_b) and a noise estimation (N_o) (see Equation 14 and Equation A.6).

Regarding claim 8, Divsalar et al. discloses in a receiver (page 262, Fig. 3) including interference cancellation in a multiple access communication channel, the receiver adapted to receive a signal for the communication channel including a first data component (page 261, column 2, paragraph 2, user data) for a first channel within, the multiple access communication channel and a second data component (multiuser interference) for a second channel within the multiple access communication channel, a method of providing a data estimate comprising the steps of:

estimating (page 267, Equation A.6) a signal-to-noise ratio (E_b/N_o) for the signal;
applying a function (page 267, Equation A.6) to the signal-to-noise ratio to determine a soft data estimate (page 264, column 2, paragraphs 3 and 4) caused by the second data component ($a(k-1)$) received on the multiple access communication channel on a power control group (user) by power control group basis (user) for each of the first data component and the second data component; and

subtracting (page 264, Equation 18) from the aggregate received signal (Y) the signal estimate ($I(k)p_k$) involving soft data estimate (page 262, Equation 9, wherein $I(k)$ includes the soft data estimate ($a(k-1)$) of the second data component.

Regarding claim 9, which inherits the limitations of claim 8, Divsalar et al. discloses the step of estimating a signal-to-noise ratio comprises estimating a first signal term (E_b) and second signal term (N_o) (see Equation A.6).

Regarding claim 10, which inherits the limitations of claim 8, Divasalar et al. discloses the function comprises a piece-wise linear estimation of the hyperbolic tangent (see Equation A.6).

Regarding claim 11, Divsalar et al. discloses in a receiver (page 261, column 2, paragraph 2) including partial interference cancellation in a multiple access communication channel, the receiver adapted to receive a signal for the communication signal including a first data component for a first channel (desired user data) within the multiple access communication channel and a second data component for a second channel (multiuser interference) within the multiple access communication channel, a method of providing a partial interference cancellation coefficient comprising the steps of:

estimating (Equations 12 and 14) a first signal term (E_b) and a second signal term (N_o) of the signal;

applying a function to a signal-to-noise ratio (page 267, Equations A.2) to determine an intermediate parameter (see page 262, Equation 9, $I(k)$) caused by the second data component (see page 262, Equation 9, $I(k)$) received on the communication channel on a power control group (user) by power control group (user) basis, wherein the a power control group is defined as each user;

using the intermediate parameter (Equation 14) to determine a partial interference cancellation coefficient (p_k).

Regarding claim 12, which inherits the limitations of claim 11, Divsalar et al. discloses using the intermediate parameter to determine a second partial interference cancellation coefficient is determined for a plurality of given users (page 262, column 2).

Regarding claim 13, which inherits the limitations of claim 11, Divsalar et al. discloses the function comprise a piece-wise linear estimation of a probability error function (page 267, Equation A.2).

Regarding claim 14, which inherits the limitations of claim 2, Divsalar et al. discloses the partial interference coefficient (Equations 12 and 14) is based on estimates of the received signal that involves the first data component (a_k) and a channel estimate (E_b/N_o).

Regarding claim 15, which inherits the limitations of claim 8, Divsalar et al. discloses the partial interference coefficient (Equations 12 and 14) is based on estimates of the received signal that involves the first data component (a_k) and a channel estimate (E_b/N_o).

Regarding claim 16, which inherits the limitations of claim 11, Divsalar et al. discloses the partial interference coefficient (Equations 12 and 14) is based on estimates of the received signal that involves the first data component (a_k) and a channel estimate (E_b/N_o).

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Misra et al. (U. S. Patent No. 6, 963, 546) and Huang (U. S. Patent No. 6, 385, 185) disclose canceling multiuser interference in a CDMA system.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Curtis B. Odom whose telephone number is 571-272-3046. The examiner can normally be reached on Monday- Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on 571-272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Curtis Odom
February 2, 2006


CHIEH M. FAN
SUPERVISORY PATENT EXAMINER